

Tsunami deposits from the 3500-bp caldera forming eruption of Aniakchak Volcano, Alaska

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Abstract. A discontinuous pumiceous sand, a few cm to ~40 cm thick, occurs up to 15 m above mean high tide within Holocene peat exposures of the northern Bristol Bay coastline of Alaska. The deposit ranges from fine to coarse, poor to moderately well-sorted sand, and contains rip-up clasts of peat. The deposit consists of pumice, volcanic glass, crystals, beach sand, and freshwater and marine diatoms. Major-element microprobe results for glass shards are similar to the compositional range documented for the ~3500 yr BP Aniakchak eruption. Further, multiple radiocarbon dates from peat fragments at the base of the deposit strongly support correlation of the deposit in time with formation of the caldera. Spatial distribution and sedimentary characteristics are consistent with emplacement by tsunami within Bristol Bay. Pumice contained in the deposit is interpreted as fallout tephra that blanketed Bristol Bay following the climactic Aniakchak eruption. We propose tsunami generation by entry of voluminous pyroclastic flows into Bristol Bay. Given the many frequently active volcanoes within a few tens of km of shoreline in Alaska, volcanogenic tsunamis are a credible hazard associated with future volcanic events along the Aleutian arc.

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